National STEM League: TEN80
2015-2016 Scale-Up Program

Overview: TEN80: Student Racing Challenge, one of five National STEM League (NSL) Challenges, offers an entry point into STEM for everyone with a broad range of team roles, projects, and challenges that keep students involved for years and the comprehensive curriculum that prepares them for success in college and STEM careers.

Grade Levels: 6-12

Program Summary (Download the "Wall Post Overview" at this link.)

The National STEM League (NSL) is a practice league for future professionals and a product of over a decade of research-based, classroom-tested development that has yielded an exciting approach to project-based learning that doesn't forget the learning or the usual limitations of science, math and CTE classrooms.

TEN80: Student Racing Challenge is a model that has proven to build a strong foundation for building community support and for future growth into all the opportunities open to partners with TEN80 Education in the NSL. The "Racing Challenge" supports 21st century skills and the Iowa Core Standards as participants collaborate, create and if they choose to, compete in ways that mirror professionals in business, project management, marketing, graphic and web design, race engineering, small scale manufacturing (3D design and 3D printing, mechatronics) and innovations in driverless cars (open source software and hardware) and sustainable energies.

Students "own" a motorsports team. Their racecar is one-tenth scale, electric, and radio-controlled. The technology arrives ready-to-run, so the first weeks of engagement are spent learning how systems operate and how to organize data rather than following "build" instructions. Once students master the fundamentals of problem solving, data and mechanical systems, they specialize into areas of personal interest.

This curriculum can be implemented as a stand-alone STEM course (one semester or year round), out-of-school club, summer camp, or integrated into core math and science classes. Download a list of Suggested Implementation Schedules and Guides.

Competition is optional but suggested. There are two ways to compete: (1) web-based points race and (2) the 2016 Iowa Open Invitational. Leaders in both earn invitations to the National STEM League Finals in May 2016. Teams compete in head-to-head races and time trials, Data-Driven Design projects that may include renewable energies or driverless programming, enterprise categories and community leadership presentations in which they do well by doing good.

Project Description/Objectives
- Increase the number of students actively and sustainably engaged in STEM and the process of innovation;
- Increase the number of educators who understand STEM as an opportunity to engage all students in team-oriented, project based learning and that know how to achieve desired learning outcomes as stated in the Iowa Core through STEM education;
- To ensure sustainability, train local partners to run invitationals and STEM Expos (school assemblies to engage all students in STEM);
- And, increase mentorship of educators and students through Ten80's coalition of national and local partners.

What does the project provide?
- A Program manager will oversee IOWA implementation and meet with state-level organizers in each year of implementation.
- TEN80 trainers will provide ongoing web-based professional development and 24/7 access to forums, recorded sessions and resources.
- Two years of registration into the National STEM League competition per site will provide coaches and students with access to the web-based points race and feedback from remote mentors that review and comment on student submissions.
- A donated Innovation Station that includes three 3D printers and license to TEN80's Innovation Space online course will offer one centrally-located host the opportunity to offer training to educators, students, and potentially generate revenue from the course.
- Per school, a donated Robo RaCeCar kit, so that one team of students at each site can specialize into open source coding and hardware.
- SolidWorks 3D CAD program is sponsored for all students participating in the NSL (student license, not networkable).
- With a minimum number of implementing sites, TEN80 will send a team to run regional invitationals and the Iowa State Finals.
- TEN80 will train local partners to organize invitationals and school-based STEM Expos.

What is required by the applicant in order to implement this program?
- **AUG:** Educators attend any of the **two-day trainings** scheduled in the first two weeks of August (two days between 8/3 – 8/14).
- **FALL through EARLY WINTER:** Implement the curriculum as a one-semester, year-round course or out-of-school club.
- **MARCH/APRIL:** Release and support travel for students and educators to attend an **Iowa State Open Invitational**.
- **MAY:** If funding secured, support travel for students and educators to attend the **National STEM League Finals** (location TBD, May)

Website to View Program and Standards Alignment: www.Nationalstemleague.com/Racing-Standards-and-Schedules

Student Produced Video: http://www.nationalstemleague.com/video-students-student-racing-challenge